Hot In-Place Recycled Asphalt Pavement

Interim Report

Experimental Feature X(04)03 – New Products

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Indroduction

Old asphalt pavements tend to become cracked and rough riding resulting in a less than “pretty” appearance, even though they are still showing no structural impairments. A process to redeem the ride and aesthetics has been initiated whereby the existing pavement is heated with a radiant process and scarified to a depth of 2”. Next it is windrowed in the process, picked up, relayed with a conventional asphalt paving machine and compacted.

Background Information

Paveover Inc. is the contractor that specializes in this type of rejuvenation process. The recycling train consists of a pre-heater that preheats the asphalt pavement to remove excessive moisture prior to the main heating and milling process. The pre-heater unit is towed behind a 1500 gallon capacity propane supply 5 ton truck. The truck is equipped with two 80/40 propane vaporizers. The pre-heater utilizes high airflow burners fired horizontally, one foot above the pavement, into an insulated steel enclosure designed to dissipate the moisture while heating the entire lane width. Four hydraulic cylinders are utilized to raise and lower the burner system as required. Rubber tired wheels used for towing are replaced by steel wheels for operation. Emissions are naturally aspirated through exhaust stack into an emissions combustion chamber where unburned hydrocarbons are incinerated prior to discharge.

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Goal

This process was an attempt to eliminate the surface cracking caused by the aging process and produce a finished product that would be visually acceptable and functional.

Objectives

Heat and remix the top 2” of old asphalt pavement by heating and remixing to eliminate roughness and aging.
Extend the life of the pavement for a few years.

Construction Information

The work was performed in September 2004 and the visual inspection of both projects was very promising with good results anticipated.

There were two sites selected for this process, US 89 at MM 250 +/- SR 25 (Fish Lake Road). Both projects were about 6 miles in length.

The US 89 project design called for adding heated chips to utilize anticipated excess asphalt. The finished mat look just like new asphalt paving.

The Fish Lake project was something different because of the variety of materials in the 2" that were rejuvenated making it difficult for the contractor to obtain a constant yield for the finished surface. The operation broke through the pavement section many times.

The cost to perform the heater recyling was $ 3.50/yd$^{2.}$

Results

A visual evaluation was performed in May 2005 on US 89 and the old cracks that were to be eliminated had already radiated through the 2" of heater recycle in just eight months. In June 2005, the Fish Lake Project was visited to see if the same thing had occurred. Again, extensive cracking was evident.

Conclusion

At this time and based upon the visual inspection in 2005, it is apparent that the recycling did not slow down the old surface appearance for very long as the cracks in the new pavement were reflecting through and matching the old surface appearance.

Now the project is being chip sealed to improve the skid characteristics. If the chips last for 5 years then maybe the project was a success. Only time will tell how the reflective cracking affects the overall condition.

The purpose of using this type of rejuvenation was determined based upon the technology advancements in the past decade, better and more consistent heat and milling action and handling processes.

The following photos show the difference between the old pavement and the recycled material. Note that the light gray is the old pavement and the dark is the recycled material at eight months.

Recommendations

The process had cracks reflect up though 2” of repave in eight months and this is not the time frame that was hoped for. The chip seal applied in the next season is something that should be evaluated for a few years to see if there is any early failure that may be caused by the heater repave process.

Pavement Engineers should look really closely at the use of this process and make sure the design is for the end product desired.